

**Society of Petroleum Engineers  
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**Enhanced Oil Recovery (EOR) for Unconventional Reservoirs:  
The Next Big Thing?**

**B. Todd Hoffman  
Montana Tech**

**Abstract:**

Unconventional reservoirs have had tremendous success over the last decade due to technical advances including long horizontal wells and multi-stage hydraulic fracturing; however, their potential may be even higher. There are trillions of barrels of oil in these resources, and while wells start out at high rates, they decline quickly and primary recovery factors are low, often in the single digits. This clearly indicates a need for some form of enhanced oil recovery (EOR) for these types of reservoirs.

In this presentation, the efforts to implement EOR in unconventional reservoirs will be examined in full detail. A number of different injection fluids have been proposed including miscible gas, water and surfactants. Early work focused on modeling and lab studies, and this provided a base of knowledge that was leveraged to carry out pilot field studies. Pilots have been implemented in at least four basins, and the Bakken and Eagle Ford have both had multiple field trials. Huff-n-puff natural gas injection has been shown to be very successful in the Eagle Ford, and today, large-scale field development is occurring there.

Because most of the field trials have been completed in North America, the examples presented are mainly from there; however, as these techniques are reproduced in other basins, the worldwide potential is enormous, and that potential also is discussed in the presentation.

While much has been achieved over the last decade in unconventional reservoirs, implementing EOR in these types of reservoirs will likely bring about even greater success.

**Biography:**

Todd Hoffman is an Associate Professor in the Petroleum Engineering Department at Montana Tech. He teaches classes on Reservoir Simulation, Enhanced Oil Recovery, and Unconventional Reservoirs. Prior to that, he was a reservoir engineering consultant to the oil and gas industry. Todd has worked on reservoir models for more than 30 fields on six continents, and has published over 50 technical papers. His research involves improved recovery for conventional and unconventional reservoirs, fractured reservoir modeling and history matching. Todd received his B.S. in petroleum engineering from Montana Tech and his M.S. and Ph.D. in petroleum engineering from Stanford University.